



EMBEDDED
OPEN SOURCE
SUMMIT



EMBEDDED
LINUX
CONFERENCE

Accelerated Mainline Linux Development Ahead Of SoC Availability

Date: 2023-06-28

Bryan Brattlof

Praneeth Bajjuri

About Us: TI Processors and Open Source



Decades of contribution and collaboration



Ingrained culture to give back to the community



Upstream FIRST!

Focus on long term, sustainable and quality products

Upstream and opensource ecosystem in device architecture



Upstream FIRST mentality!



About Me



Bryan Brattlof – Texas Instruments

- Linux Software Developer
- Bootloaders – U Boot



Praneeth Bajjuri – Texas Instruments

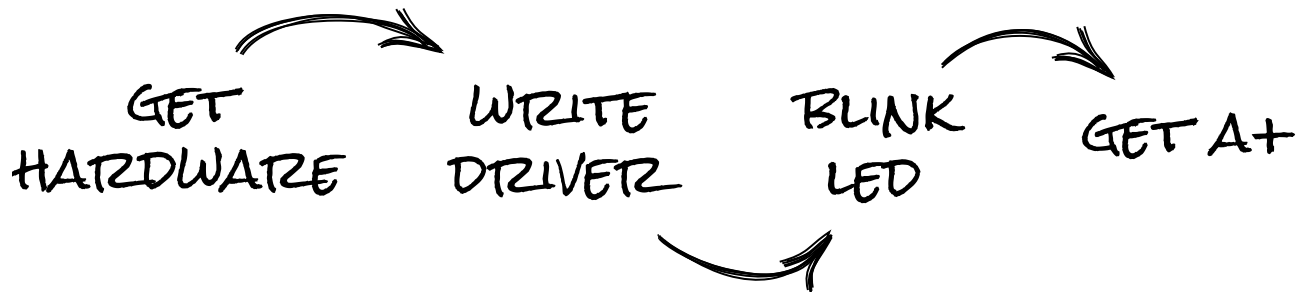
- Linux SW Manager
- Android Enthusiast
- Product Tree Maintainer

Disclaimers

This is a technology presentation, not product-readiness or roadmap commitments

The opinions represented here are mine and do not reflect Texas Instruments

The Design Process In School



Work Smart Not Hard




please write me a Linux driver to blink an LED



Sure! Here's an example of a simple Linux kernel driver that can be used to blink an LED connected to a GPIO pin:



c

 Copy code

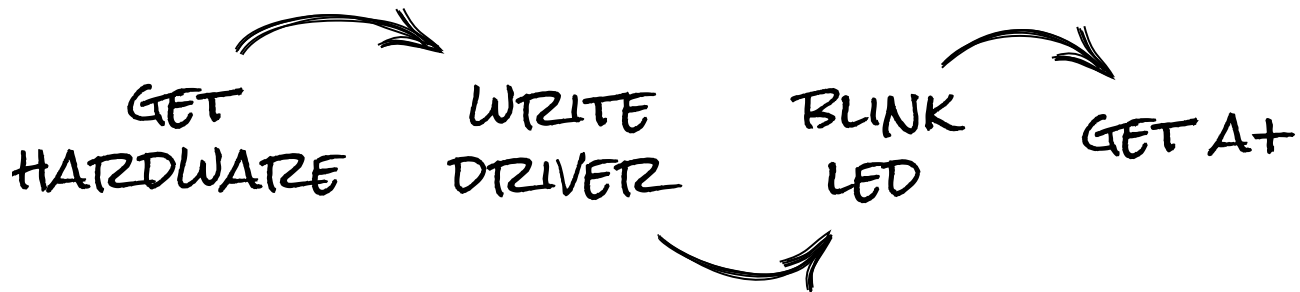
```
#include <linux/init.h>
#include <linux/module.h>
#include <linux/gpio.h>
#include <linux/timer.h>

#define LED_GPIO_PIN 17 // GPIO pin number to control the LED
#define BLINK_DELAY_MS 500 // Blinking delay in milliseconds
```



TEXAS INSTRUMENTS

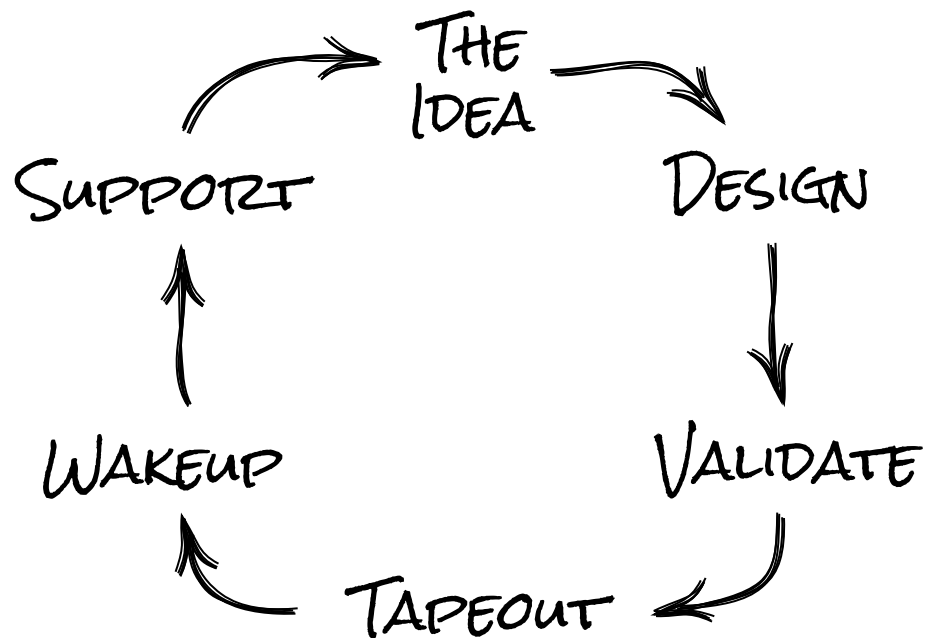
The Design Process In School



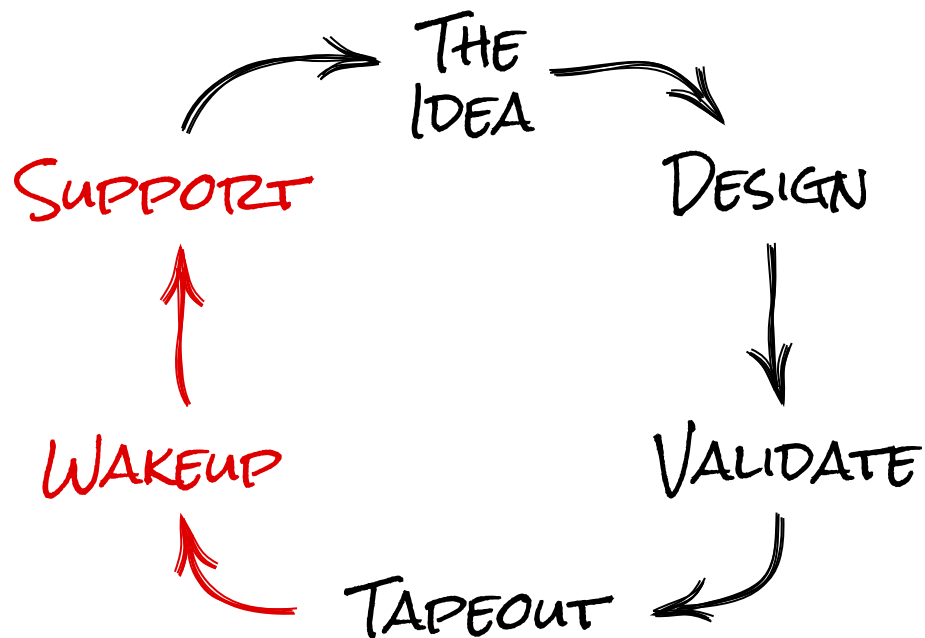
The Design Process In School



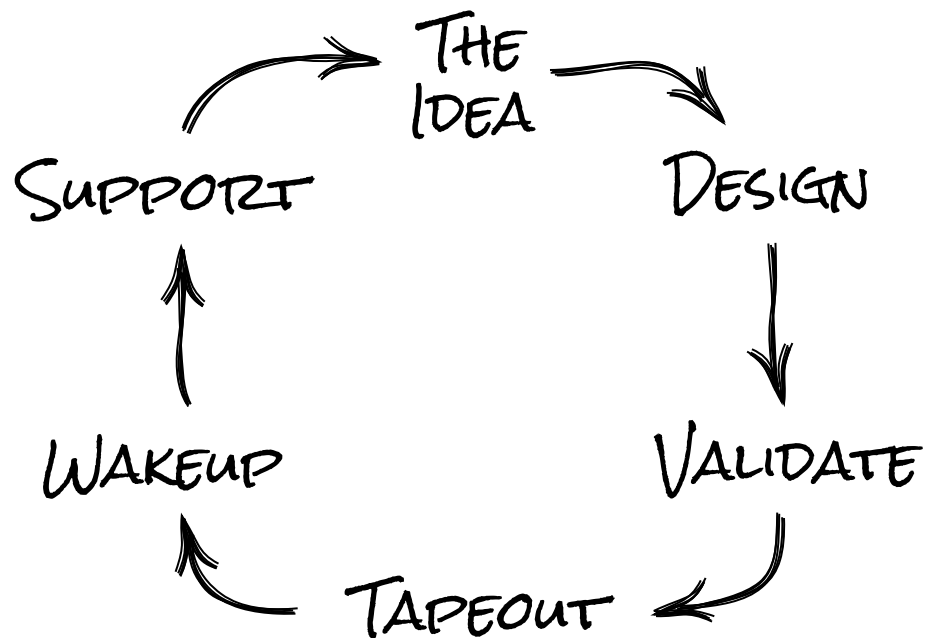
The Design Process



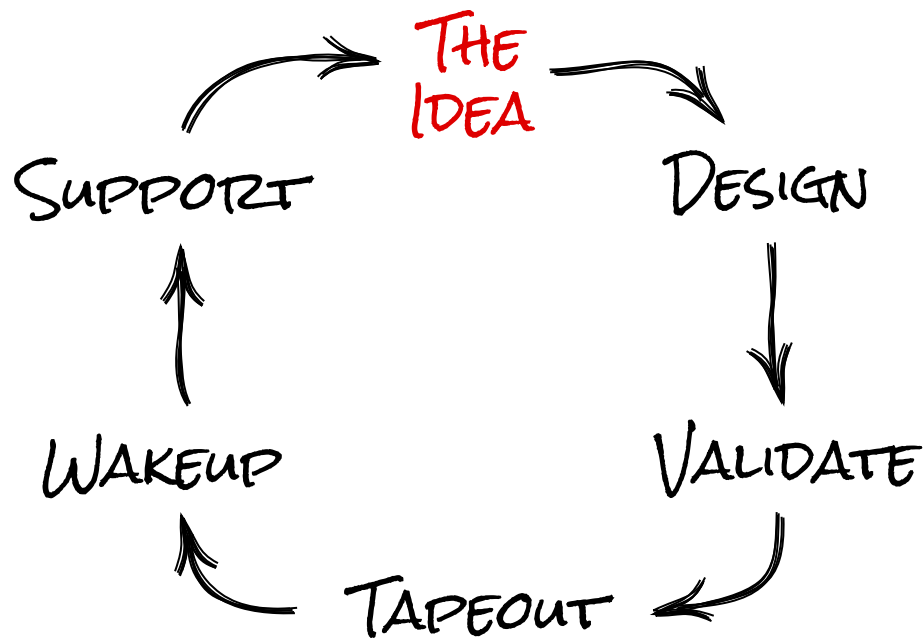
The Design Process



The Design Process

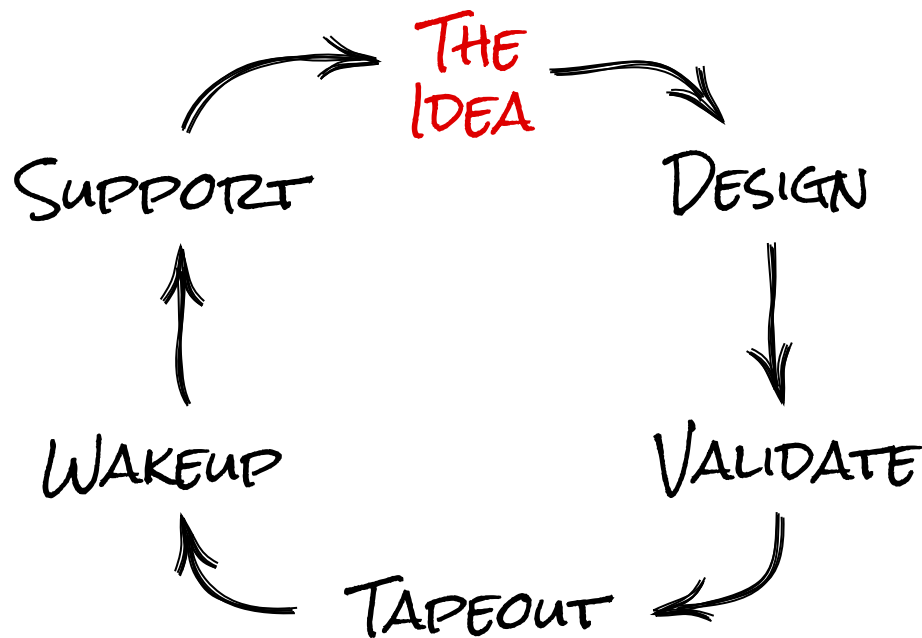


Step 1 - The Idea



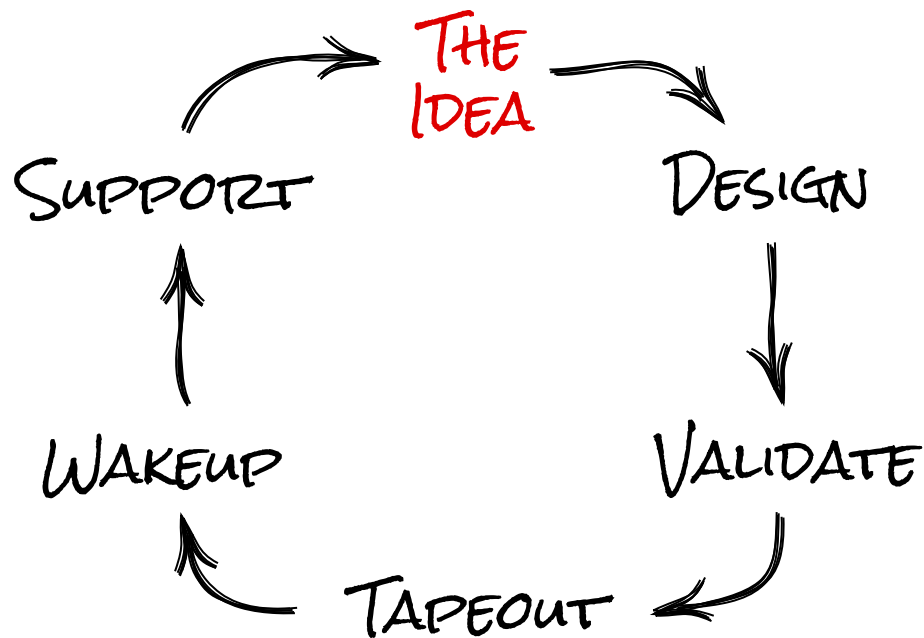
WHAT DO WE WANT
TO MAKE THIS TIME

Step 1 - The Idea



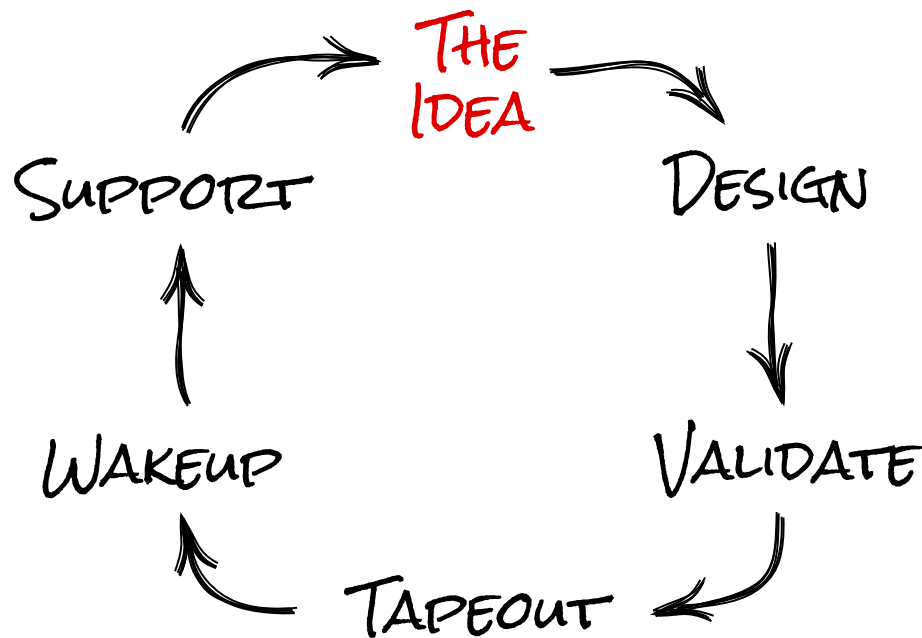
IDENTIFY A MARKET
AND COMMUNITY FIT

Step 1 - The Idea



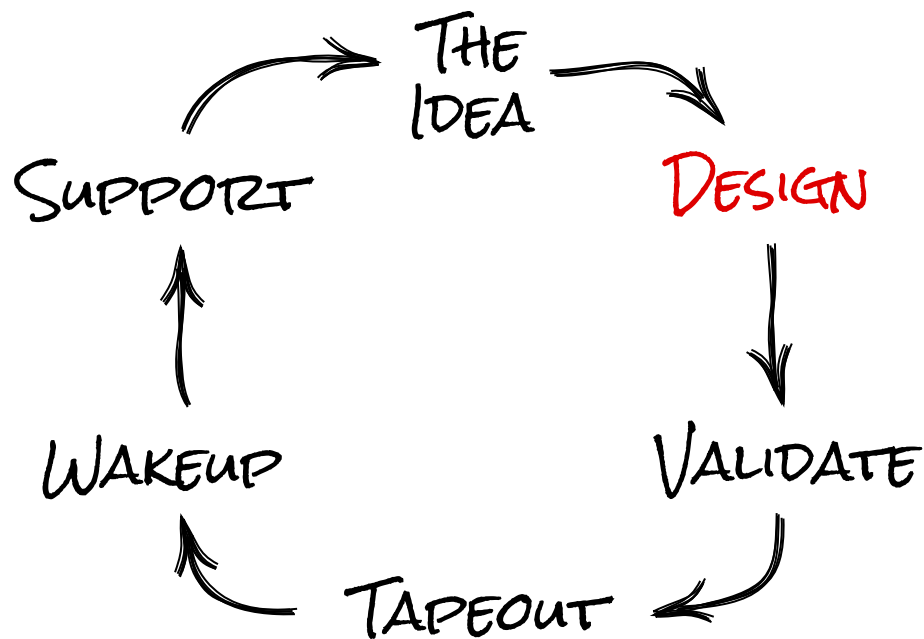
WILL THE LINUX
COMMUNITY SUPPORT IT

Step 1 - The Idea

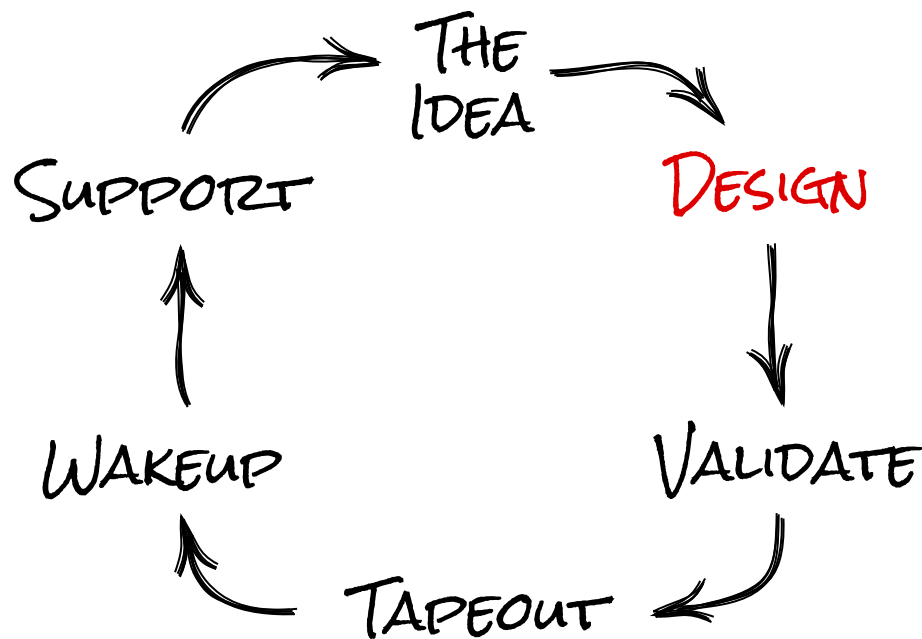


HOW OPEN SOURCE
FRIENDLY ARE THEY

Step 2 - Design



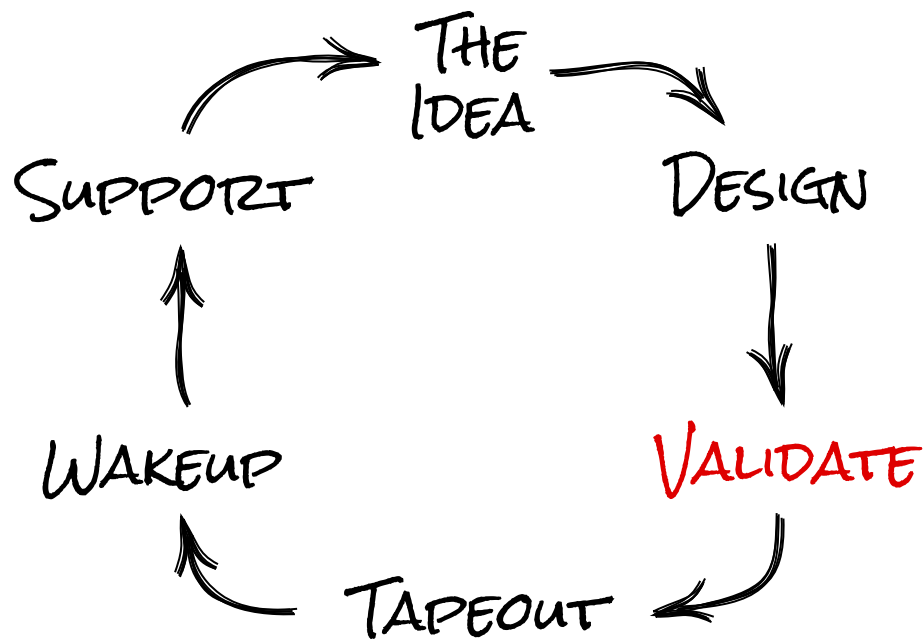
Step 2 - Design



DESIGN DETAILS

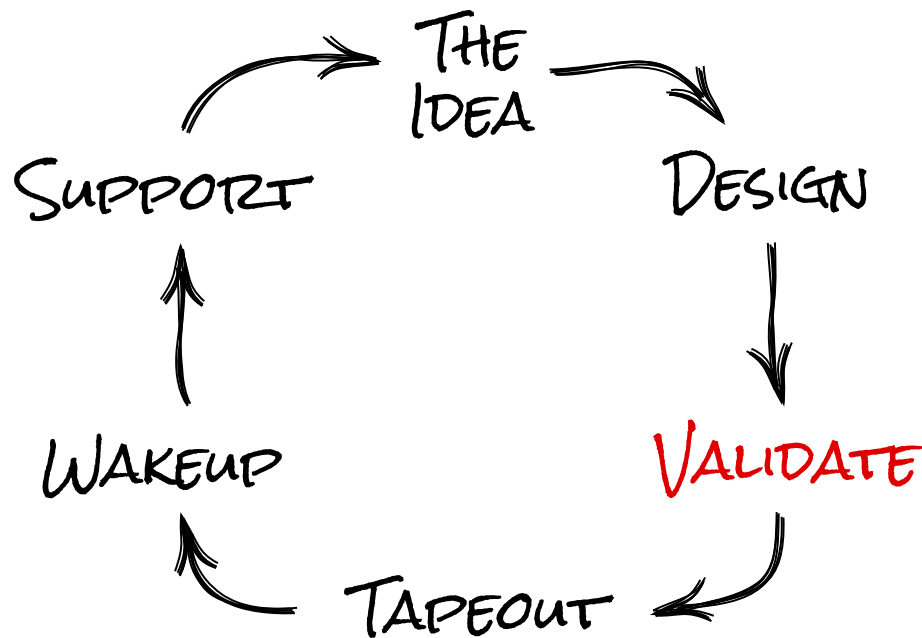
HOW WILL THIS WORK WITH
EACH LINUX SUBSYSTEM?

Step 3 - Validate



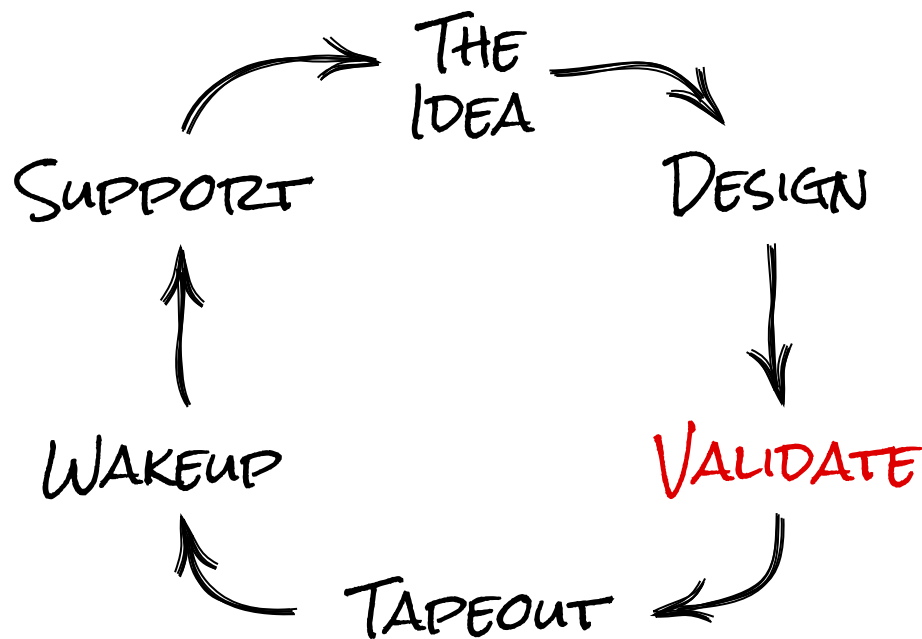
IMPLEMENTING
THE DESIGN

Step 3 - Validate



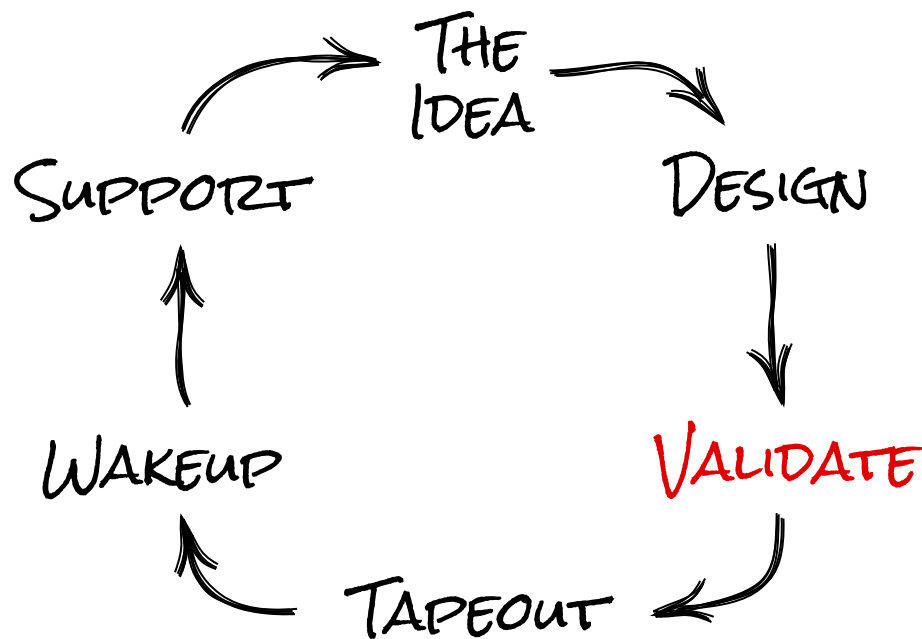
VLAB - QEMU FOR CHIPS
GREAT FOR INITIAL DRIVER
DEV OR LARGE REFACTOR

Step 3 - Validate



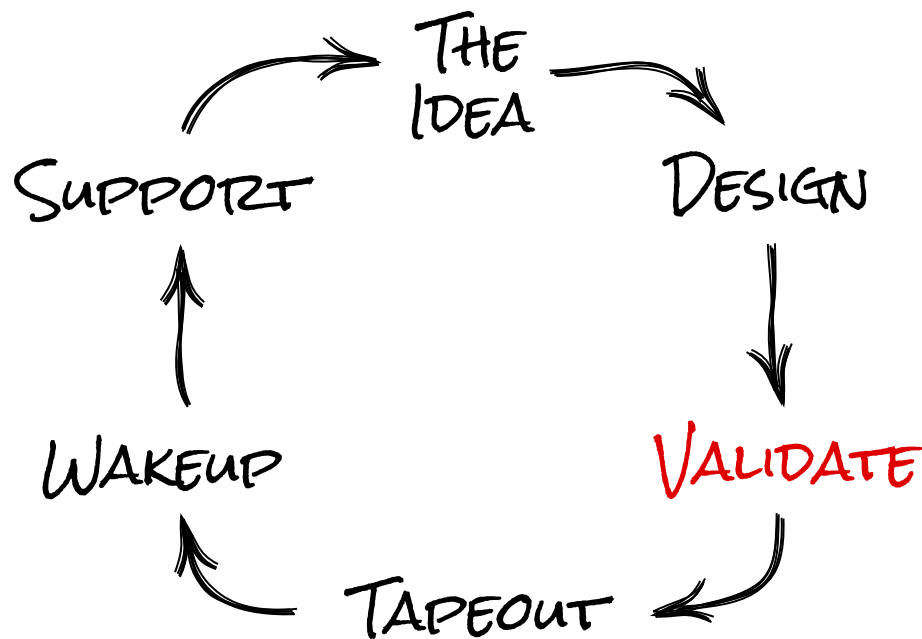
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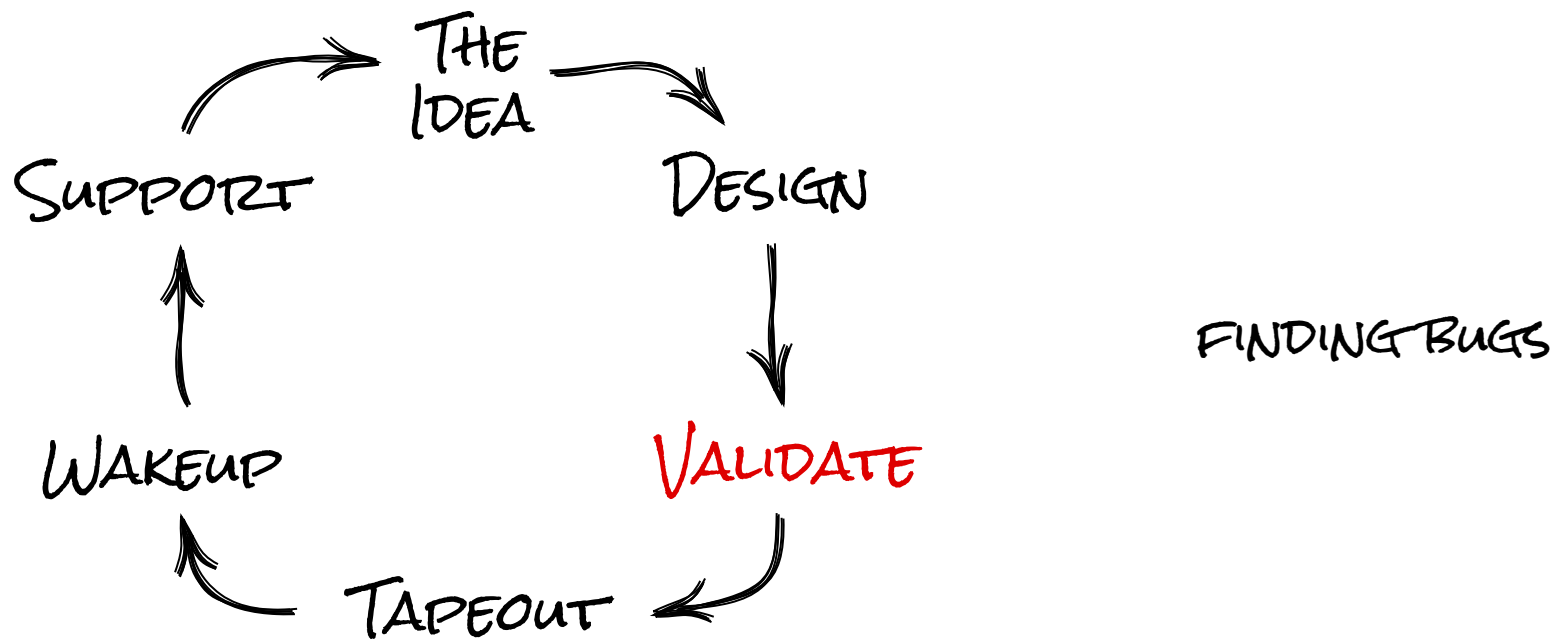
EMULATION
CYCLE ACCURATE MODELING
TO GET PERFORMANCE DATA

Step 3 - Validate

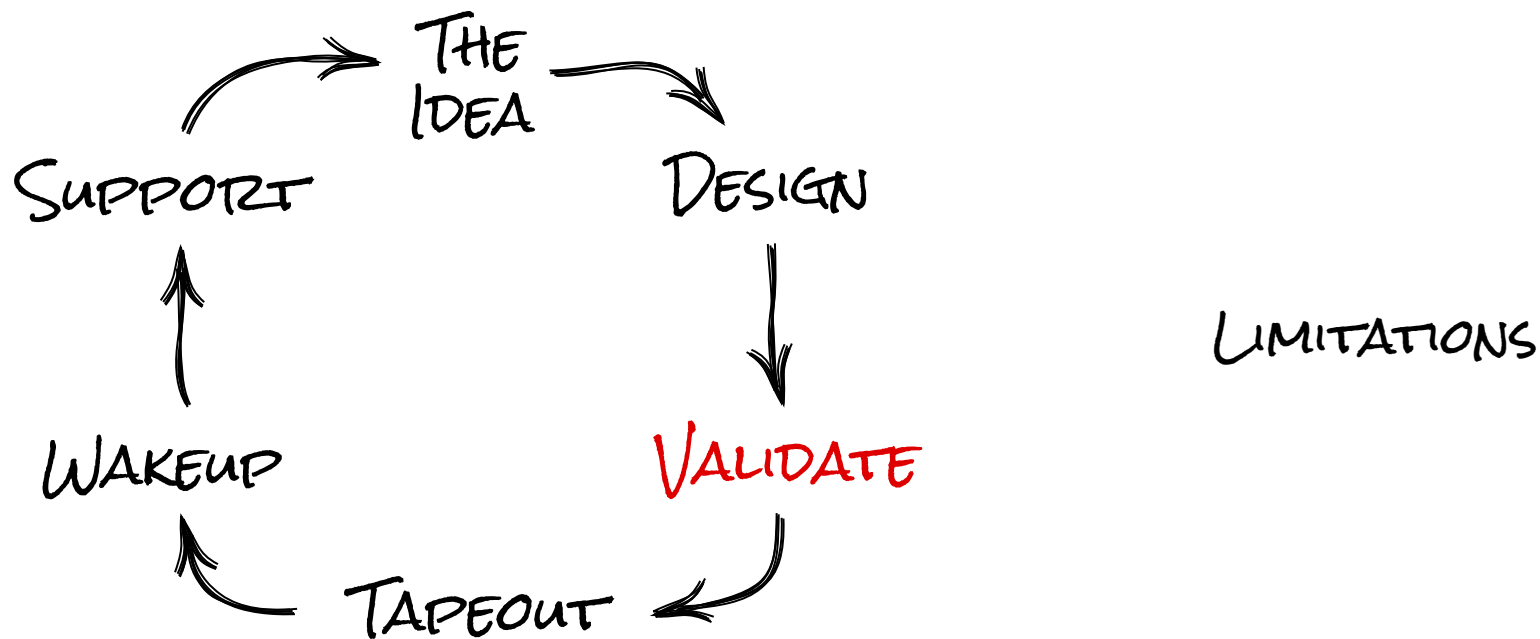


EMULATION
CYCLE ACCURATE MODELING
TO GET PERFORMANCE DATA

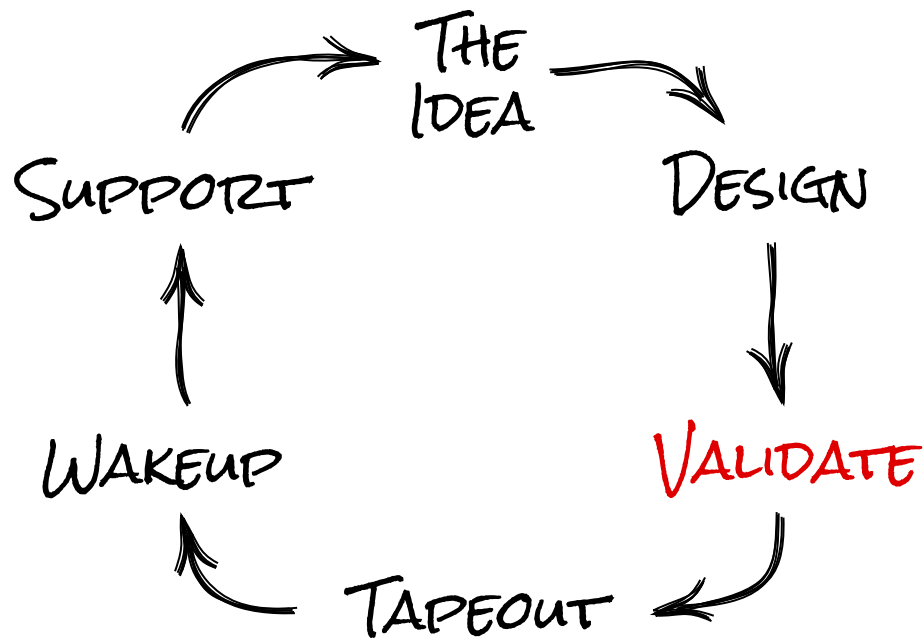
Step 3 - Validate



Step 3 - Validate

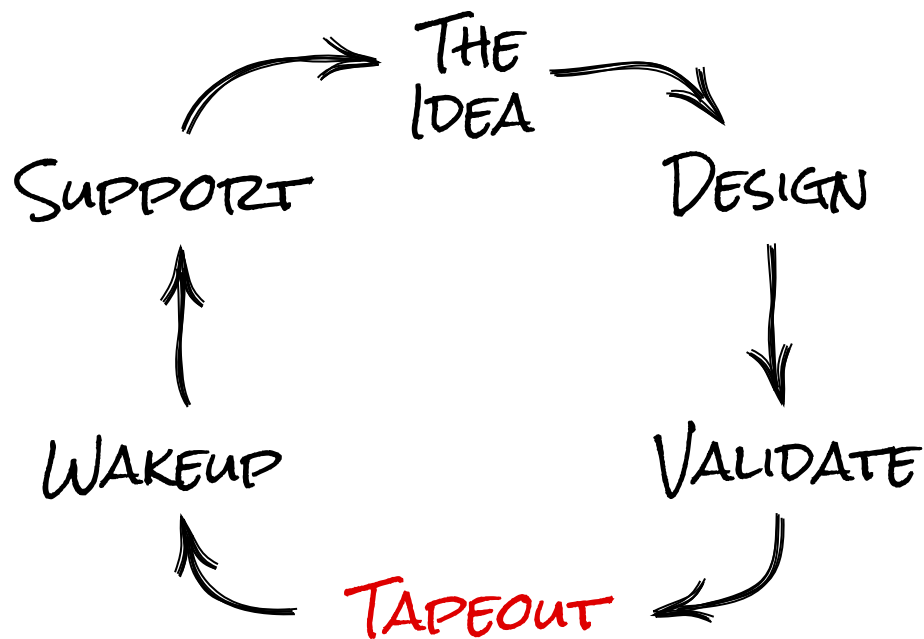


Step 3 - Validate



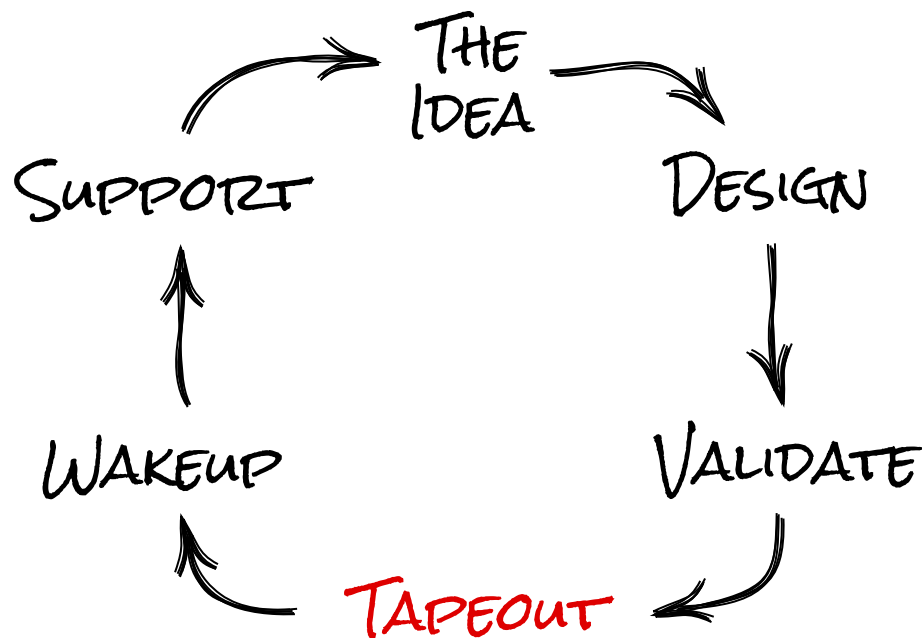
GAIN CONFIDENCE
IN OUR DESIGN

Step 4 - Tapeout



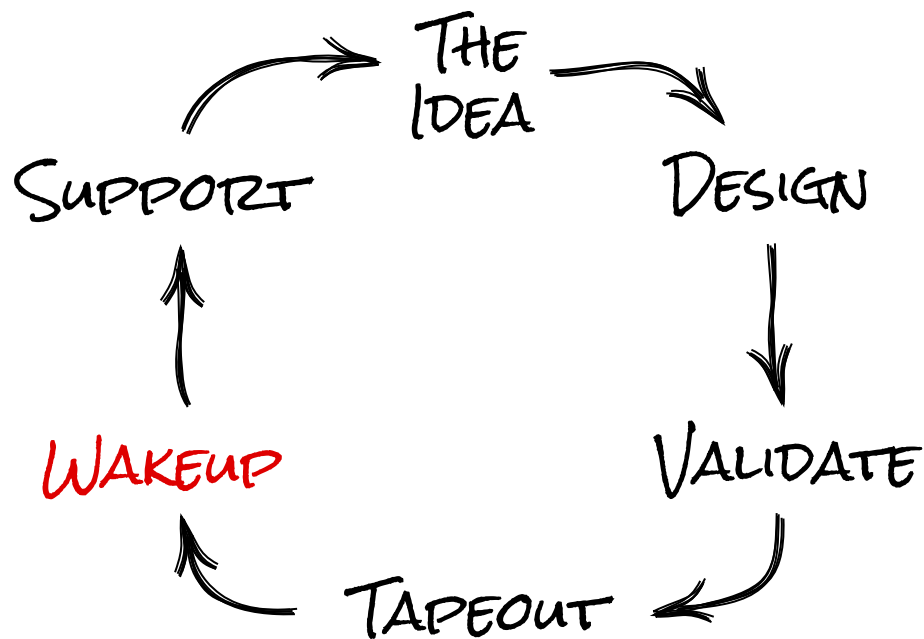
SENDING THE DESIGN
TO BE REALIZED

Step 4 - Tapeout



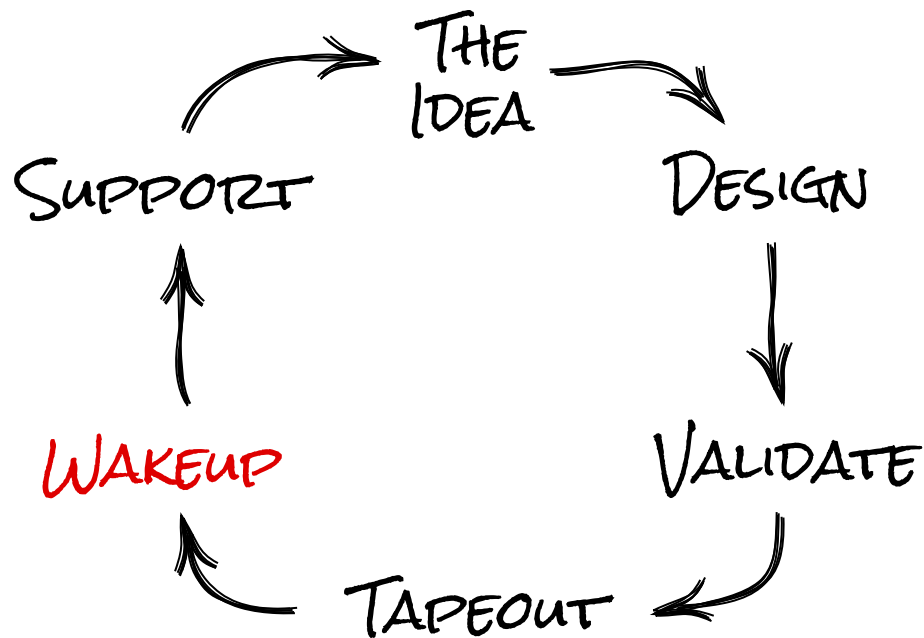
THE SUPPORTING
COMPONENTS IN LINUX

Step 5 - Wakeup

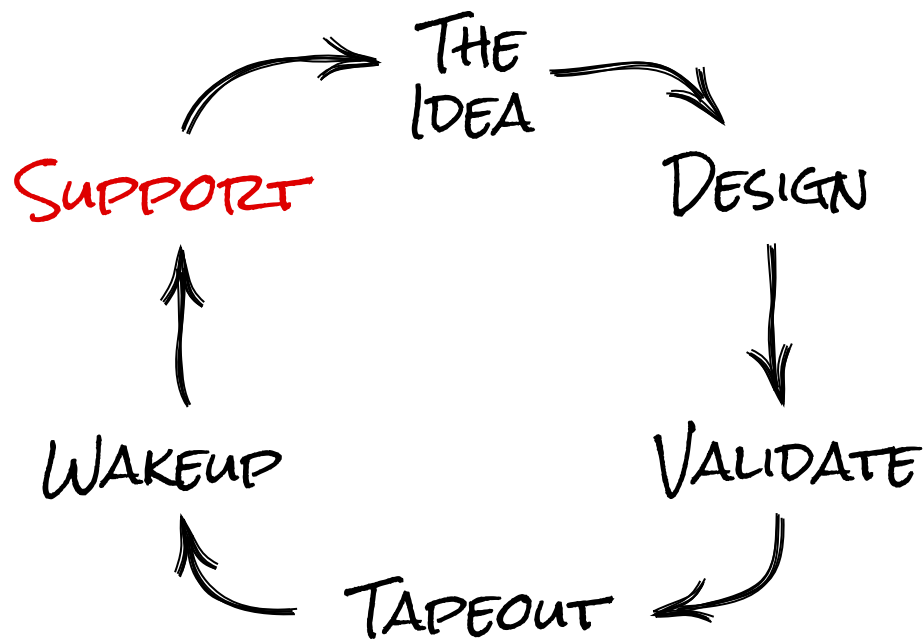


FIRST SIGNS OF LIFE

Step 5 - Wakeup

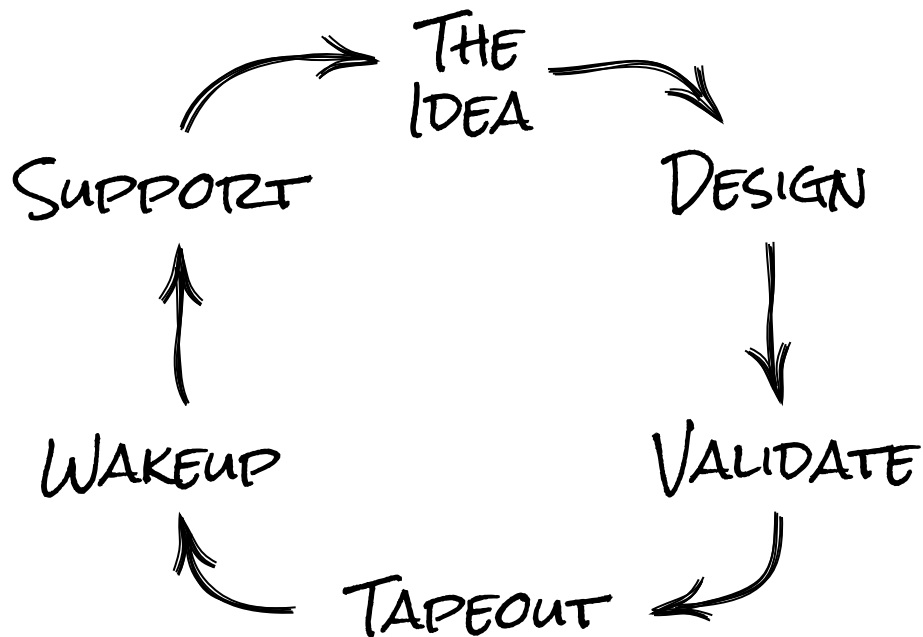


Step 6 - Support



MORE BUG HUNTING

Wrapping Up



Credits and Acknowledgements

- **Texas Instruments Inc.**
- **The Linux Foundation.**

Q&A

- **Contact Information:**

- Bryan Brattlof <bb@ti.com>
- Praneeth Bajjuri <praneeth@ti.com>

- Also on IRC @ libera.chat #linux-ti

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We strive to make innovation accessible to all by creating cost-effective products that feature state-of-the-art technology and package designs.

✓ Availability

Our investment in internal manufacturing capacity provides greater assurance of supply, supporting your growth for decades to come.